Clinical Proceedings

of the

CHILDREN'S HOSPITAL

WASHINGTON, D. C.

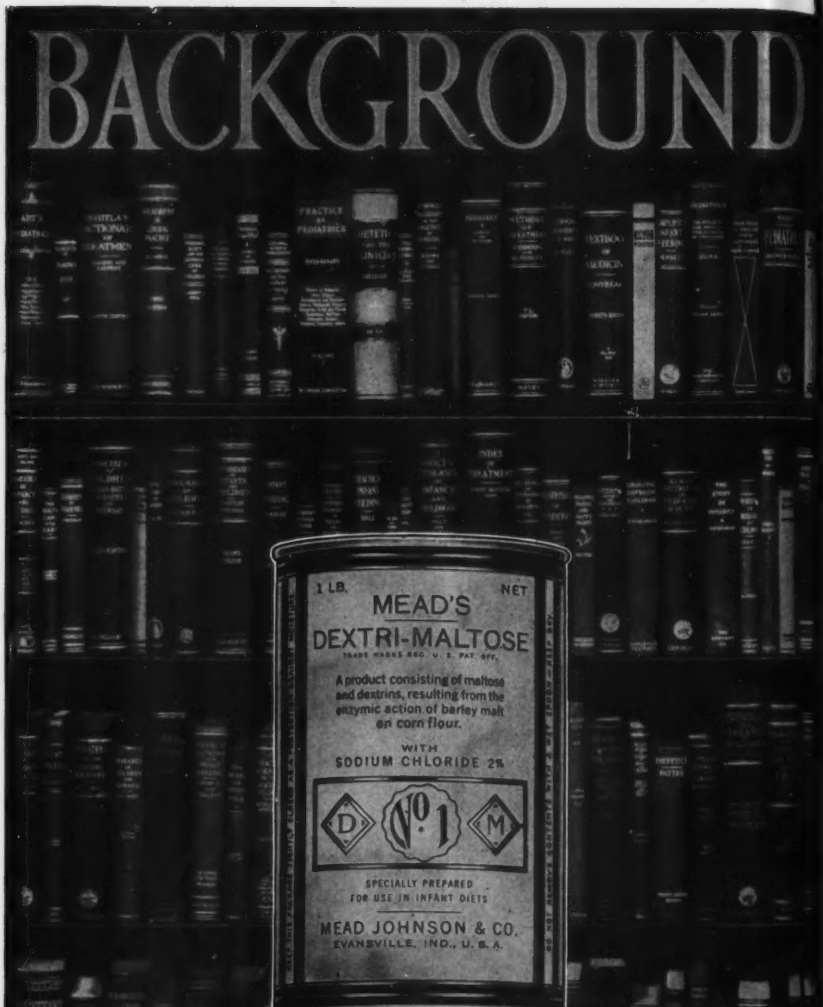
Contents

Vol. V MARCH 1949 No. 4

Entered as second class matter November 21, 1946 at the post office at Washington, D. C., under the Act of March 3, 1879 Acceptance for mailing at special rate of postage provided for in Section 538, Act of February 28, 1925, authorized January 17, 1947.

Published monthly by the Children's Hospital, 13th and W Sts., Washington, D. C.

Subscription rate is $1.00 per year.



THE use of cow's milk, water and carbohydrate mixtures represents the one system of infant feeding that consistently, for over three decades has received universal pediatric recognition. No carbohydrate employed in this system of infant feeding enjoys so rich and enduring a background of authoritative clinical experience as Mead's Dextri-Maltose.

ANOREXIA NERVOSA

Case Report No. 143

Morris Tandeta, M.D. V. L. 48-7430

This 11 year old white female of British birth was admitted to the hospital on August 8, 1948, with the chief complaints of failure to eat and loss of weight. Her anorexia had begun about 15 months previously during convalescence from a severe case of measles with complicating otitis media. Soon after this the family moved from England to this country and she was enrolled in the Blessed Sacrament Convent school in Chevy Chase, Md. It was there that she began dieting seriously because she wanted to be thin like so many of the other girls. Her parents were not aware of this situation until some time later, however. Last Christmas she was discovered concealing food and forcing herself to vomit, having become quite set in her determination not to eat. In June of this year she was hospitalized here because of her absolute refusal to take nourishment. On that admission she weighed slightly over 50 lbs. and was in severe acidosis. Following symptomatic therapy she was sent to the Christ Child Convalescent Home, Rockville, Md., where she was pleasant and dutiful but did not take part in play with other children. She lost four pounds in weight while at the home, and because of her steadily downhill course it was deemed advisable to hospitalize her again.

On this admission she stated she could not eat though she would like to do so. She volunteered that she disliked certain foods very much: for instance, eggs, sweet potatoes, and ice cream, but she did like chocolate milk. Her subsequent hospital course and family history will be brought out later by members of the visiting staff and Dr. Lourie.

Physical examination on admission revealed an extremely emaciated pale, shy, white female of about 11 years. Positive findings were atrophy of the papillae of the tongue and rigidity of the abdominal muscles with slight generalized deep tenderness. The examination was otherwise negative except for evidence of an extreme wasting state.

She was placed on a selective diet with multivitamin supplementation. BMR determinations were done and ranged from minus 29% to minus 38%. A glucose tolerance curve was normal. A gastro-intestinal series revealed stasis and hypomotility of the small intestine with mucosal pattern changes suggestive of atypical and disturbed motor physiology. Until one week ago, for a period of 16 days, she was being fed by gavage although she took a little nourishment on her own with encouragement. Her weight, which had reached 49 pounds, is now again declining. At present her weight

is 47 pounds seven ounces, approximately 30 pounds underweight. She is 56 inches tall.

FIG. 1

DISCUSSION

Richard H. Todd, M.D.: The family history is interesting in that the father is a Colonel in the British Marines and was a Commando during the war. He is a strict disciplinarian and the child's only contact or close contact with the father has been for the period of this illness. Before that her father was on duty away from home most of the patient's life. The mother is no disciplinarian at all and has difficulty in controlling the other five children without the father's aid. The family dates the onset of the

present illness, the loss of appetite, to May, 1947 following a severe attack of measles. Up to that time the mother said the child would eat normally. She herself had fed the child very little when she was an infant, since they had a nurse who took care of the patient. The nurse stated that there were periods during which she wouldn't eat, but no longer than those of the average infant. During the first three or four years of life she would pass through stages in which she would hold food in her mouth, but the nurse did not think this abnormal. At the time that she became ill with measles in May 1947 her weight was 67 pounds which was average for her age group.

The bout of measles lasted for some time, being complicated by bilateral otitis media, for which she had a paracentesis of both ear drums. She was given sulfa therapy for a period of a couple of weeks. During this illness there were no symptoms which would suggest encephalitis. While the child was in bed she had no appetite and had to be fed, and when she recovered from the measles her appetite never returned completely. The mother consulted, on several occasions, three different physicians in England because of this loss of appetite. They thought it was more or less a normal reaction after a severe illness and that her appetite would return to normal. Then in August of last year, the family came to America. Her course since then has been progressively downhill. She continued to refuse to eat food despite the fact that she would often prepare it for other members of the family and on several occasions she stole chocolate candy which she apparently liked and could eat. On one occasion she stole a pound of candy from a store and ate the whole box at one sitting.

The first record that Dr. Crawford has is a routine examination in February, 1948 at which time her weight was 64 pounds and her height was 55 inches. Her mother complained chiefly of her poor eating habits. Dr. Crawford estimated that she was 11 pounds under weight. She was a sort of a sulky individual at that time and she cooperated rather poorly. There were no physical abnormalities except for the weight loss. Then in April of 1948 the sixth child of the family was born and while her mother was away at the hospital, the girl, according to her father, ate remarkably well. Now this was the first time she had eaten well since the onset of the measles except for one other period of two weeks when she was visiting an English friend. At the suggestion of Dr. Crawford she was sent to these friends to stay for two weeks, and the lady at that house states that she ate well. After the mother returned home from the hospital the patient went on a real hunger strike and at this time psychiatric help was sought. Dr. Crawford lost track of her for several weeks during which time she was under psychiatric care and the mother was given instructions not to mention food to her and not to force her to eat. During three days on this regime the mother said that she took nothing but approximately 3 pints of water and

Dr. Crawford was called in the middle of the night because she had started vomiting. She appeared to be markedly acidotic and she was taken to the hospital where she was treated with intravenous therapy. With the intravenous fluids she snapped out of the acidosis. During her stay here the child ate very poorly although at times the nurses reported she had eaten fairly well. We later discovered that she was hiding some of this food in waste paper baskets when the nurses weren't looking. She gained a little bit under this forced feeding regime, went up to 54 pounds and was transferred to the Christ Child farm where she did worse than she had done at the hospital. She refused to play with the other children and she has never eaten with the other children in the hospital. When she does eat she insists upon eating alone. She began to lose weight again, losing five pounds in spite of the intensive care which was given at the Christ Child farm. They became worried about her condition there, so she was transferred back to the hospital for further care.

On this admission we decided that something had to be done about her, since she had gone down to about 45 pounds. She was fed by gastric gavages and much to our surprise she began to rely on them so that when we stopped them she had reached 49 pounds, and she was very much upset. Her tuberculin test was one plus, but x-rays of her chest were negative for any pathology. During the stay here she has made very little progress except the small weight gain she made during the gavages. It seems that we gave her some stimulus by saying that she could go home when she hit 50 pounds. We said that when she weighed 49 pounds, but in spite of that stimulus she has been unable to eat enough to gain one more pound. She seems depressed by the fact that she cannot gain and I think she would very much like to return to the gavages until she reaches 50 pounds.

I feel sure that this girl would go on to complete starvation if allowed to proceed in her own way. I have no doubt that at the time of the hospital admission she was on the brink of real starvation. She does represent more or less a risk of life if she gets out of the care of physicians or if the family gets discouraged and cease taking her to a doctor. At the present time, as Dr. Tandeta said, she is about 30 pounds under weight and it doesn't look like we can do very much about it as yet.

It is interesting to note how the systems have adjusted to the low caloric intake of this patient. Her basal metabolic rate has dropped to minus 30, the glucose tolerance test shows a flat curve with a level at about 80 throughout the test, and the blood pressure remains at about 80 systolic and 50 diastolic with a pulse rate of 50 to 60. There is a hypomotility of the bowel to allow as much absorption as possible with a consequent constipation. Without such adjustments this patient could not survive and maintain her present weight as she does now on a diet of one quart of milk and two tablespoonsful of sugar.

This case represents a very severe case of anorexia nervosa. The one condition most often confused with this unusual malady is pituitary cachexia or Simmond's disease which is usually diagnosed at autopsy. X-rays of the skull show no abnormalities of the sella which does not exclude the possibility, but makes it unlikely.

We feel that this is primarily a psychiatric problem and it has been put in the hands of Dr. Lourie's department.

Dr. Lourie: I was very happy to start with this case because most everything that has been referred to me since has seemed quite easy. This case has been a very interesting one not only from the point of view of the physiological changes that have occurred but also from psychological aspects. We have watched the body maintain itself in terms of homeostasis, changing in metabolism, changing in gastrointestinal tract function, etc. in an attempt to maintain a chemical and functioning balance when the individual through neurotic reasons was not giving it the means to maintain a normal balance otherwise. From a psychological viewpoint this child presents very fascinating aspects, even if we only think of a child acting this way when her first reaction to coming to America was "Oh, we're going to a land where there's lots of food of all the kinds we want."

Our first impression when we saw this girl was of a very cadaverous, passive, ultra-polite, correct, 9 year old child with very little spontaneity, who was superficially very conforming but basically very stubborn. At that point she was listless and dispirited, refused contact with everybody as much as she could, to the point where we were suspicious at first glance that she might have some schizoid aspects to her personality. We were very happy to see that those patterns of behavior could change.

Going into her background, sketching this picture from the material collected from the parents and the child and also material that Dr. Todd and Dr. Crawford have contributed, we see that she stems from an upper middle class family that was fairly well-to-do. Vivian was the darling of an old bedridden maternal grandmother in whose home they lived out in the country on an English estate. They were very well protected there all during the war and had very few repercussions if any from the disturbed war conditions in England. Their father was away, but this was a somewhat chronic situation for a professional soldier. There was some deprivation in terms of food, but the basic elements of a healthy diet were present. However, Granny made up to this girl some of the rationed items. Granny couldn't eat sweets and she would give this girl all her lumps of sugar and share her biscuits. She is reported to have selected this girl for a show of preference.

Vivian has a very warm, sincere, devoted mother, one who is very rigid in her moral concepts, including the code of behaviour in which she indoctrinated this child, particularly concerning the attitudes toward conven-

tions that a gentlewoman should have. She was very successful in passing on this concept to the girls. The home atmosphere besides was also quite religious. The father was a rather remote romantic figure to this girl. She had very little contact with him all through her early years. He was reported to have been quite a war hero. When we see him, we find him on the surface a somewhat self-effacing individual in whom one senses a basically aggressive personality. This girl, however, in terms of any pressure or punishment from the parents feels that she can get away much easier from punishment if the father is around and has to inflict it. She can usually talk him out of it. The mother is the one whose punishment sticks.

Her next older sister, eight years old, is a much different kind of a child from our patient. She is a tomboyish, very vivacious individual who presented all the things that the father admired in a child. She was the one who won friends easily, she was the one who was praised, she was the one who was much better in the kinds of activities that the father particularly admired such as horseback riding. Our patient's attempts to become a horsewoman failed although one of her ambitions for the future is to be a riding mistress. As far as the patient herself goes in relation to this older sister, there was a considerable rivalous situation, particularly when the father appeared on the scene more consistently in mid 1947.

As far as the patient herself goes, we can approach her from three aspects in order to understand her reaction to this problem a little better, i.e. her attitudes towards school, her attitudes towards relationships in the family and to other people in general, her need to be perfect in terms of her mother's indoctrination and her attitude toward food. As far as her attitude towards food goes, we obtained a slightly different story than given before. The mother reported that this girl cried every night with colic for her first three years. She was something of a feeding problem, particularly between her first and second years when she needed to be fed, when she needed to be read to while she was being fed, and so on. Then she reverted completely to the opposite pole, becoming a very good eater—as a matter of fact she changed so completely that she loved food. Interestingly, she still loves food. She is constantly preoccupied with food. Her greatest delight in talking to people she meets is to ask them what they had at their last meal. Her greatest satisfaction on the ward is to be able to help serve juices and food, and at home her greatest satisfaction was in cooking and baking, particularly for her father. Her mother describes how ingenious she was about it—she made up her own recipes for instance, and they turned out pretty well. Her interest in food and skill in preparing food is probably the chief sphere in which she excels her sister.

Looking again into her background, we find that she was a girl who had

considerable illness such as a series of boils, colds and ear infections, to the extent that she didn't attend school and was tutored by a governess. This went on until about one and a half years ago when she encountered her first school experience. She was behind in studies for her age and her perfectionistic drive made her very miserable in terms of what she was able to accomplish at school. She would literally spend hours with her arithmatic lessons and wouldn't be satisfied with the way someone did it for her if they helped. She never finished that first school year because of the measles, its complications and prolonged convalescence with the beginning of her current problems. She came to the U. S. and was placed in the fourth grade in parochial school, but very soon was shifted to the fifth grade where she was over her head and completely miserable about her work. It circumscribed her activities considerably because of her need to be perfect, and the resulting pressure on herself to complete everything. She detested failure and she refuses to answer questions that leave her open to failure. She would not even begin anything that she felt she couldn't do very well. This pattern is still present.

The mother's usual punishment for misbehavior was to send the child who was offending up to its room where she would have to eat alone and she would have only a very sparse meal without dessert. I have wondered whether our patient's present attitude toward food couldn't be tied in part to this pattern of punishment. We see her in this illness needing to eat alone and she insists now that even when she goes home she must be allowed to eat by herself in her room. I think it probably is significant in terms of this kind of punishment by the mother that Vivian also began to steal candy, the family's favorite dessert, when she stopped eating. One might suspect the child of having a need to punish herself by the manner in which she cut down on her food intake, but at the same time defying or even punishing her mother by not only eating dessert, but stealing it and thus violating the mother's teaching. At about this time too, there was apparently considerable publicity in England about an institution where a great many people became ill and some of them died from eating a dessert. Vivian reports this to us a something she remembers vividly.

After the measles, about the time the father came back into the family picture more consistently, we recognize a change in relationships between this child and her parents, particularly with her mother and her sisters. There has been some question on the part of different observers as to what direction the change took, whether Vivian became more hostile toward her mother or whether she was more hostile against her father. That question is something for the future to elucidate, but at least we know that the relationships were disturbed in the family setting. Because of these disturbed and disturbing relationships with the child's drive to hurt one of the parents

which was an unbearable idea for her, she began to feel a need to punish herself. Apparently she has used food as one means of punishment. She also became preoccupied with the idea that the wrong food could kill her grandmother—for example, if her grandmother ate the rationed items, sugar, biscuits and so on, she was afraid Granny would die. She worried too that her mother might die, and it would happen in some way through food. She became afraid that the younger siblings would die, and that could result from mother not feeding them. It is at this point in her thinking that we see the most marked decline in the child's eating habits, and this thinking persists.

This background brings us up to the point where we can follow the patient's story in terms of the situation that was current when we saw her in the hospital five weeks ago. When we examined this child, we were struck first of all by the lack of anxiety she had. In other words the feelings behind this symptom seem to have been compensated for and her symptoms seem to be keeping her compensated so that she is comfortable. She is completely at ease about not eating, even though paradoxically she loves food and at the same time she doesn't want to die. We often suspect in such situations that there may be a suicidal drive of some nature but in her case we can't put our finger on one. Her anorexia appears to be primarily serving as a means of punishment that she is inflicting on herself directly and perhaps on others indirectly.

Another interesting facet of this problem is her complaint that the feeling which keeps her from eating is a feeling of fullness that comes often with the first mouthful of food. It is this feeling of fullness which she refuses to have us tamper with. She refuses to have any attention drawn to it. It's apparently a very pleasant, even satisfying feeling. She refuses any medication for it. In other words it is something that she wants, and we have wondered if it is the thing that protects her. Under intravenous sodium amytal she brought out that if the fullness disappears, something might happen to her family. This would on the surface seem to be similar to obsessive-compulsive symptomatology as we understand it in the adult, but I doubt if we should think of it completely in such diagnostic terms here, in spite of the definite compulsive elements we see in this girl's personality makeup. We can speculate in many ways as to what the feeling of fullness means and we hope that we will eventually know its symbolic value so that treatment can be better directed.

What we probably need to do is to deliberately decompensate this girl emotionally, deliberately create some anxiety so that she is upset about the things she is doing, so that they are not serving the purpose as well as they seem to be now. In regard to the tube feeding, it was hoped when that became necessary, that it would help create anxiety, but it hasn't. On

the contrary it was withdrawal of the tube that created some transitory anxiety, but that hasn't lasted. The first real feeling of anxiety we saw was yesterday in terms of her becoming upset by the illness of the other children on the ward which may be related to her worries about her family.

Among the other aspects of this girl's reactions that are very interesting is the fact that her behavior patterns which were present when we first saw her on the ward have changed. The factor which seemed to motivate that change stems from our work with her in the psychiatric clinic. She had begun to feel that it is all right to feel hostile, to have feelings of hate even somebody you love. It was difficult at first for her to accept this concept because she felt it was against her religious principles. We cleared it however with her uncle who is a priest. As soon as that was accepted by her, she began to channel a great deal of hostility putting it all in one place and that was on the therapist. She would come down to the office insisting "I don't want to go back." She would remain for an hour not saying a word, punishing me in that way, showing her hostility openly for the first time. It was very interesting that simultaneously she became more cheerful, lively, skipped around the ward, and would greet people when they came to the ward instead of withdrawing. This punishment of another person will be helpful if it can continue to be channelized. It is probably through this kind of relationship that one can build a treatment approach, even though the relationship is a hostile one. We hope that by creating anxiety we can approach a change in this girl's thinking and acting. We feel that probably the best place to work out these feelings and this type of thinking is in the home setting where the problems of relationships originate and where she will be dealing with them every day. We have hopes that our greatest therapeutic accomplishments will come when this girl obtains a sufficient physical balance to be allowed home, at least on a vacation basis to see how she does there while she continues in treatment.

There are one or two generalizations about this kind of problem that could be mentioned. Such malignant forms of anorexia are rare in preadolescent children. Anorexia nervosa is not common in any case but it is more usually found in children who are facing the problems of puberty and adolescence, which does not seem to be true here. The psychiatrists who work closely with these problems in older age groups have found that there are many sexual components involved. The prognosis must always be guarded even though there are increasing reports of patients who have made good recoveries, usually with prolonged psychiatric treatment. Such patients very often need repeated periods of hospitalization to bring them back to a weight level that is safe enough to allow them to function in the community.

The use of food as the means by which individuals punish themselves is

not an uncommon phenomenon in our culture. Most religions use it by having fast days for penitence for example. Many people stop eating favorite foods for Lent. The use of food as a punishment in puberty rites is found in primitive cultures. Anthropologists give us many instances of this kind. We may suspect this child came to the use of food as a means of punishing herself through first her early training in regard to food, second possibly through her religious training, and third, in terms of the significance food has taken in her household as a means of punishment.

ACCIDENTAL INGESTION OF BORIC ACID

Case Report No. 144

Elmer O. Bean, M.D. J. V. 48-9721

J. V., a seven day old white male, was admitted to Children's Hospital on August 22, 1948, after having received in error boric acid in its formula in place of Dextrimaltose. In the last three feedings prior to admission, the infant had received twelve ounces of formula which contained approximately 7.5 grams of boric acid. He had vomited profusely at each of these feedings, the parents estimating that he must have lost most of the formula.

On admission, the temperature was 99.8° (R), the pulse 204, and the respirations 96. The infant's skin was very red, particularly over the face and neck, but it was of good turgor. The patient did not appear to be in acute distress, although he screamed when the abdomen was examined. The remainder of the physical examination was essentially negative.

The infant was immediately lavaged, and a small amount of sodium bicarbonate was left in the stomach. Blood drawn on admission showed a carbon dioxide combining power of 30 volume per cent. Shortly after entrance, one-sixth molar lactate was given intravenously and by clysis, and the child was placed in an oxygen tent. Because he vomited all of his formula feedings, the child was given 2 ounces of Darrow's solution every 2 hours (NaCl, 2 grams; KCl, 3 grams; distilled water, 700 cc.; molar lactate 40 cc.). The following day he received 160 cc. of 5 % glucose in Hartman's solution and later 160 cc. of normal saline by clysis. At this time, his temperature rose to 100.8°, the pulse was 140, and the respirations 50. During the first two days, he voided only once, barely dampening the diaper. On the third hospital day, a urinalysis was obtained which was negative except for 10 mgms. of albumin. Further clyses of glucose in saline and one-sixth molar lactate was given to correct the acidosis and restore the electrolyte balance. The carbon-dioxide combining power had risen to 46 volumes per cent. On the evening of the third day, the temperature rose to 103.6° but promptly returned to normal following the administration of antipyretics. During the first four hospital days, the infant also exhibited a mild diarrhea. An additional complication included a rash over the entire body. From the fifth day on, the infant's condition appeared to be good. Normal amounts of urine were passed, the rash cleared slowly, and the patient gained weight. He was discharged on the ninth hospital day after an uneventful recovery.

DISCUSSION

Reports of cases of boric acid poisoning by one means or another appear sporadically in medical literature, although textbooks usually contain little,

if any, reference to this entity. Even though poisoning is uncommon despite its universal use, boric acid is generally conceded to be a dangerous drug[2, 4, 6, 7] and in many institutions it has been removed entirely from use. The drug has long been forbidden as a food preservative in the United States and many foreign countries. Deaths directly attributable to boric acid have been reported where the drug was used in irrigations, powders on chronic leg ulcers, in wounds, as a burn ointment, boric acid enemas, accidental ingestion, boric acid fomentations in traumatic wounds, abortifacients, cleansing nipples with saturated solutions, accidental clyses, intravenous administration, bladder irrigations, dusting of burn wounds, and irrigation of empyema cavities.[3] The boron ion is found throughout the body; however, in most areas, there is no apparent effect from it. The site of predilection for location of the ion has been found to be the central nervous system, boron occurring in both the white and gray matter, as well as in the peripheral nerves. The spinal cord and gray matter of the cerebrum contain the highest amounts, showing neuronophagia and hyperchromatosis. Smaller amounts are found in the liver, bowel, heart, lungs, kidneys, and diaphragm, in that order, in six cases reported by McNally and Rust[4]. Kahlenberg was able to detect the presence of boric acid in the urine in as little as fifty seconds after immersing the feet in a warm saturated solution[2]. In boric acid poisoning, the kidney shows tubular degeneration; the liver is only slightly affected histologically. The exfoliative, erythematous rash is probably due to the polymorphonuclear infiltration and vascular engorgement of the skin. It may be that the same vascular phenomenon occurring in the gastro-intestinal tract accounted for the diarrhea and abdominal tenderness observed in the present case. Reports to date are not clear on many of the actions of the drug. The presence of severe acidosis in boric acid poisoning, even in the absence of vomiting, has not been satisfactorily explained, and suggests that additional quantitative analysis of blood and urine is desirable.

The fatal dose of boric acid in infants has been variously reported as from two to six grams and in adults, from fifteen to thirty grams[1, 3, 5, 7]. This patient received approximately 7.5 grams orally, but vomited most of it. Practically all reports in the literature comment on the "boiled lobster" appearance of the skin, particularly of the face and neck, which was noted in this case. This infant also exhibited the exfoliative, erythematous rash resembling an eczema, the hyperpnea, and the absent to low-grade fever, which are often mentioned, at one stage or another of the hospital stay. That some toxic effect on the kidney tubules was present was evidenced by the pronounced oliguria noted during the first three days. This and the slight albuminuria are in keeping with the findings of McNally and Rukstinat[3]. The presence of acidosis is also common, being fixed in cases

ending fatally. The obvious tenderness on abdominal examination which was manifested in this patient and the mild diarrhea during the first four days are also in keeping with the findings of others.

The fact that this patient recovered from such a large dose of boric acid administered orally is, or course, most likely attributable to the fact that he vomited a major portion of the drug almost immediately after ingestion and to the prompt lavage. The administration of chlorides and other fluids to counteract the displacement of that ion by the boron ion in the body fluids and to restore electrolyte balance was also of prime importance.

SUMMARY

1. A case of accidental ingestion of 7.5 grams of boric acid in the formula of a one week old white male is presented in which the patient recovered.
2. The usual findings of scarlet color of the skin, acidosis, hyperpnea, low-grade fever, abdominal distress, oliguria, and central nervous system irritability were observed.
3. A short discussion of the literature is presented.

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PROLAPSUS UTERI WITH INVERSION IN AN INFANT

Claude A Frazier, M.D.

The purpose of this paper is to present a case of prolapse and inversion of the uterus in a three months old infant. On a review of the literature this was found to be the earliest case reported other than those which were found to have the malformation at the time of birth.

Findley [1] discussed the frequency with which prolapsus uteri in the newborn was associated with spina bifida and how the two are often found with other congenital defects such as hydrocephalus, club feet, prolapse of the rectum, disturbed sensations in the lower extremities, paresis of perineal muscles and inguinal hernia. Procidentia in the newborn is rarely in evidence at birth but usually develops in the following week. However, such infants rarely mature and death results from an associated lesion rather than from the procidentia. There are several theories as to the relation of the spina bifida to the procidentia uteri. These include (1) faulty innervation of the supporting structures in general; (2) faulty innervation of the uterine ligaments alone or disturbances in the central nervous system; (3) faulty innervation of the muscles of the pelvic floor or weakening of the pelvic connective tissue and elastic fibers in consequence of faulty innervation.

Torpin [2] reviewed the literature on prolapsus uteri in the newborn infant. Many but not all of the cases of spina bifida in the female infant are associated with prolapse of the uterus. A uterine prolapse which occurred later in life was often associated in the nullipara with occult spina bifida.

CASE REPORT

The patient was a seven months old, premature infant weighing four pounds and fifteen ounces at birth. She entered Children's Hospital for the first time at the age of one and one-half hours. On admission the infant had grunting respiration which disappeared the day following admission. On the sixth hospital day she developed diarrhea. Stool cultures did not reveal any pathogens. She was given parenteral fluids, streptomycin and put on a Nutramigen formula. However the diarrhea persisted for about a month and she was subsequently changed to an evaporated milk mixture. On the forty-fourth hospital day her temperature rose to 102°F. Urinalysis at this time revealed a few white cells and a urine culture grew out hemolytic E. coli and non-hemolytic Staphylococcus albus. This urinary tract infection cleared up within five days on sulfonamide drug. She received two blood transfusions and was discharged from the hospital weighing seven pounds eleven ounces.

On the second admission to the Children's Hospital the infant was three months old. She had become irritable, cried more than usual and seemed

to be "straining" as if she were having a bowel movement three days prior to admission. The mother, on removing the diaper, noted a small pink mass protruding about one-half inch from the vagina. The infant continued its fretfulness and the protrusion increased to some extent the following day. It receded slightly the day prior to admission. Mineral oil was being used to keep the mass moist.

Physical examination on admission revealed a well developed slightly undernourished colored female infant weighing eight pounds and two ounces. She appeared to be somewhat fretful. There was a pink mass protruding from the vagina about three-quarters of an inch. The mass was about ½ inch wide at its widest and about ¼ of an inch thick at its thickest portion. The surface was moist and showed a faint bluish mottling. There were two linear grooves on either side. The shape was ovoid and the urethra could be seen above it. The mass could be turned and rotated on the vagina. It could be visualized with the aid of a vaginal speculum as coming from the anterior part of the vaginal wall and from the upper-most portion of the vagina. No pouch was felt in the posterior vagina or anterior rectal wall. There was pouting of the external anal sphincter on rectal examination. On examination of the back there was no dimpling or evidence of spina bifida. The infant was able to hold her head up, smile and moved her head past the mid-line to follow objects. The neurological examination was negative.

Laboratory examination revealed a hemoglobin of 7.5 grams, a red cell count of 2,600,000 and a white blood count of 13,000 with 36 per cent neutrophiles, 2 per cent eosinophiles and 62 per cent lymphocytes. The blood cholesterol was 200 mgm. per cent. Blood Kahn and Mazinni tests were negative. X-ray examination of the skull, lower thoracic and lumbar spine, pelvis, sacrum, coccyx and hips in the anterior-posterior position revealed no evidence of congenital anomalies. Roentgen examination of the carpal bones revealed no evidence of ossification and there was some suggestion of retarded bone development.

By means of manual manipulation and direct visualization by the vaginal speculum the mass was replaced into its normal position. The vagina was then packed with vaseline gauze and a cotton ball. The legs and thighs were strapped together, the foot of the crib elevated and the infant placed on chemotherapy and phenobarbital. The temperature rose to 102°F. the next evening. At this time the abdomen and bladder were found to be distended probably due to the fact that the infant had not voided in 12 hours. The packs were removed, the legs unstrapped and catheterization with emptying of the bladder accomplished. The temperature dropped to normal the following day. On two different occasions an intravenous pyelogram and a flat plate of the abdomen revealed no congenital abnormalities.

The infant's temperature remained normal thereafter and the chemo-

therapy was discontinued after several days. There was no recurrence of the prolapse and the infant was discharged in good condition weighing nine pounds and nine ounces. She is being followed in the Out-patient Department.

DISCUSSION

The prolapse and inversion of the uterus may well be related to the preceding diarrhea and the prematurity. Prolapse of the rectum may be precipitated by a diarrhea and presumably so may a uterine prolapse. In this case the rectum was not prolapsed although there was pouting of the rectal mucosa on straining.

It is an established fact that congenital deformities are more common in prematures than full term infants. Because of the high incidence of congenital malformations frequently noted in conjunction with prolapsus uteri, this case will be followed closely for any evidence of such malformations which may become more apparent subsequently.

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OSTEOCHONDRITIS AND SLIPPED FEMORAL EPIPHYSIS

Case Report No. 145

Elmer O. Bean, M.D.

Case 1 D. B. 38–1873

D. B., a 12 year old colored male, was admitted April 6, 1948 with a history of having jumped off a porch five feet high three weeks previously and of limping and dragging the left leg since. At the time of the jump, the patient did not complain of any symptoms except for a slight aching pain in the left hip and popliteal area.

The past history was essentially negative, except for adiposity which had been present for years. The birth weight was 4270 grams. The weight on admission was approximately 70 kilo. He had had hormonal therapy for undescended testicles.

Physical examination revealed an alert, adipose, young colored male with increased fat localized about the breasts, mons, anterior abdomen, and girdle—suggesting a Fröhlichs habitus. The penis was infantile and the testes were undescended.

The left leg was held in external rotation and was approximately one inch shorter than the right (from anterior superior iliac spine to the external malleolus). The hip was fixed at 30 degrees on full extension. There was inability to rotate internally, abduct, or adduct. There was 85 degrees flexion from full extension. He complained of vague popliteal pain, but the hip was not tender to deep palpation.

The Hemogram revealed a hemoglobin of 10 gms.; the leucocyte count was 15,000 with 53 per cent neutrophiles. Urinalysis was negative.

On the day following admission the patient was placed in traction. On May 12 an osteotomy of the neck of the left femur was performed and a bilateral spica cast applied. On operation, the neck was found to be anteverted and in marked coxa varus position. The head of the femur was found to lie posterior to the neck. A wedge-shaped osteotomy, wedged in two planes, was performed to correct both the coxa varus and the anteversion of the neck. The basal portion of the neck was displaced beneath the head. The head was then placed in good position and a Smith-Peterson nail was driven from the base of the greater trochanter osteotomy into the head.

An x-ray taken 2 days later showed the pin to be through the superior portion of the surgical neck and into the head in the region of the superior border of the acetabulum. The position appeared satisfactory.

The patient's condition remained good. On August 13th the cast was removed and an x-ray showed the position to have remained satisfactory.

Case 2 G. B. 48–8267

G. B., a 12 year old colored male, was admitted to the hospital on July 13, 1948 because the mother noted he had been "limping" on the left leg for the past three weeks. The boy stated he had fallen from a wagon as it ran against the curb, landing on his left hip. Three days later, he fell from his bicycle when it bumped into a parked car, again hitting the left hip. He could walk short distances, but most of the time he had used crutches.

The past history was essentially negative. Positive findings on physical examination were confined to the left lower extremity. There was a 30 degree flexion of the thigh on the body, and the patient could raise himself to only 30 degree in a sitting position. Weight bearing was painful as was the limited rotation, adduction and abduction.

The urine and blood examinations were essentially negative. An x-ray on September 13 revealed the presence of a slipped femoral epiphysis.

The leg was place in traction at this time. On September 24, re-examination of the left hip by x-ray showed considerable improvement in the relationship of the head to the neck.

On the following day a Smith-Peterson nail was inserted and a bilateral hip spica cast applied. Re-examination by x-ray on September 29 showed the pin through the femoral shaft into the head in satisfactory position.

William Tobin, M.D.

It may be wise to review, for a few moments, the general nature of the condition. What is epiphysitis? What is osteochondritis? These two words are used more or less synonymously. It is a non-inflammatory process involving the epiphysis usually at the stage of its most rapid growth. This is a very important point to remember. There have been a number of theories advanced as to the etiological factors in osteochondritis or epiphysitis. The principal theories are, first: the theory of trauma. Most of these patients will give a history of trauma but it must be kept in mind that children are always injuring themselves. Trauma in a child usually means nothing; it is more or less an occupational disease because a child's occupation is playing. On the subject of the slipping of the upper femoral epiphysis, there is a stage in this condition in which there is no actual slipping. This stage is known as a pre-slipping stage. One can see a widening of the epiphyseal line. The patient may limp, have some pain, muscle spasms and limitation of motion before there are any demonstrable changes by x ray or by actual slipping of the femoral head on the neck. It is true that an episode of trauma may precipitate the symptoms as we see in these cases this morning. Another theory is that of abnormal bone development. A third theory takes into account a constitutional defi-

ciency or endocrine imbalance. The first case presented certainly is of the endocrine disturbance type. Infection is thought by many to be a factor in epiphysitis. The very word ending in "itis" certainly infers infection. This is based on the fact that in some cases of acute epiphysitis, the cardinal classical text book picture of inflammation, that is pain, tenderness, swelling and muscle spasm around the adjacent joints are present. Some authors have reported recovering a staphylococcus organism at the site of operation in the cases on for acute epiphysitis. Little is known about the infectious aspect of this condition since there are very few indications for major surgical intervention in the acute stage of epiphysitis. Slipping of the upper femoral epiphysis no doubt falls under the osteochondritic classification in contrast to the traumatic separation that one sees in the case of a child who falls and dislocates the distal radial epiphysis or the distal tibial or distal femoral epiphysis.

The first case presented, as you see, is an obese, heavy set, pituitary type with marked infantile genitalis. Endocrine therapy has been used with questionable results in this type of case. An epiphyseal separation can occur only in a growing child. Once the epiphyses have united then slipping is impossible. The most common age period is around the beginning of adolescence, usually about 12 years of age. It occurs predominantly in boys and that is where the theory of trauma comes into play. Boys are more active than girls, and are certainly more likely to receive injuries. The patient presented is in a plaster cast. This patient did not come in for treatment early but was treated rather late for his condition. The normal angle of the neck with the shaft of the femur varies considerably, perhaps from 120 degrees to 140 degrees, the average being around 127 degrees to 130 degrees. There can be variations and still fall within a normal range. Anything that approaches the right angle has the orthopedic terminology of coxa vara and that is a finding in these cases of slipped epiphyses, particularly in the old slipped epiphyses. In this case you can see a slipping of the epiphysis, rotation of the head, displacement upward of the shaft and the trochanter on the involved side is lying higher than on the opposite side. An attempt was made to reduce the slipped epiphysis by traction, but very little was gained by this method. This case was treated by an open operation, in which case the neck was osteotomized in order to restore a normal valgus position. Whatever is done, it is certainly not advisable to take the head of the femur out of the acetabulum and put it back because this is conducive to further aseptic necrosis.

It is very important in nailing these cases with the Smith-Petersen type of nail that it be done under x-ray control. The ideal situation is one in which you have two portable machines, one of which can be placed between the legs for a lateral position and the other machine can be rolled over the

patient for the anteroposterior view. The goal is a fusion of the epiphysis of the head of the femur in order to prevent further slipping. In the second case presented, the situation was a little different in that the patient was seen shortly after symptoms of slipping of the upper femoral epiphysis occurred. When this patient was admitted, he was put in skeletal traction to overcome the muscle spasm and also to reduce the upward displacement of the neck on the head. This case was operated on with the open procedure, utilizing the Smith-Petersen nail for immobilization. The postoperative x-ray revealed the nail to be in good condition, but perhaps it could be a little longer in order to get a better fixation of the neck to the head of the femur. One may question why a nail is utilized. A slipped femoral epiphysis is comparable to a fracture of the neck of the femur. Obviously, it is desirable to first reduce the separation and then after reduction to hold it reduced. This is best attained by the use of the nail. Also, it is felt that the trauma of inserting a nail through the epiphysis further helps the epiphysis to close.

The question arises whether these patients will have any discrepancy in their leg length. No doubt they will have some shortening on the involved side since the upper femoral epiphysis contributes approximately 15 per cent of the growth to the lower extremity. However, as time goes on, much of this shortening is compensated for by growth and the patient may not have much ultimate leg discrepancy.

CLINICO-PATHOLOGICAL CONFERENCE

Directed by: E. Clarence Rice, M.D.
Assisted by: D. Joseph Judge, M.D.
Edwin Vaden, M.D.

By Invitation: Maynard Cohen, M.D.

D. Joseph Judge, M.D.

This five day old infant was transferred to this hospital from an obstetrical unit with the history of moderate irritability, vomiting of feedings and almost constant crying.

The mother of the patient, a white primipara, aged 32 years, was admitted to Garfield Memorial Hospital, June 14, 1927. The pregnancy had been normal and physical examination showed no abnormality. The fetus was in the left occiput anterior position. No vaginal examinations were made. Under ether anesthesia, following a left episiotomy and with the aid of low forceps an apparently normal male infant, weighing 4155 grams, was delivered 12 hours and 31 minutes after the beginning of labor. Puerperium was entirely normal. The day following delivery the infant's general condition was good, he nursed well, the highest temperature being 99.4°F.; the weight was 3795 grams. On the second day after delivery the child appeared "irritable" when moved but nursed well, and the temperature remained normal (3615 grams). The following day irritability was still noted, but the temperature was normal (weight 3660 grams).

On admission the temperature was 101°F. and it varied from 100.2°F. to 103.4°F. Pulse was 140, respirations 30 and weight 3735 grams. The physical examination was entirely normal. Initial laboratory work was negative except for a leucocytosis of 20,000 with 55 per cent polymorphonuclear cells.

On the sixth day there appeared to be some improvement, but the temperature varied between 100.6°F. and 101.8°F. On the seventh day vomiting of projectile type, generalized convulsions and twitchings of the facial muscles were noted, as was nystagmus, rolling of the head and cyanosis. The temperature varied between 100°F. and 101°F. (weight 3615 grams). Therapy consisted of fluid supportive therapy. The following day cyanosis was more marked and a tentative diagnosis of intracranial hemorrhage was made. Spinal puncture was done, but no fluid was obtained. One hour and a half later a similar unsuccessful attempt was made both by spinal tap and by cisternal puncture. An intraperitoneal injection of 40 milliliters of 10 per cent dextrose solution was given. The patient had numerous convulsions until death at 11:20 P.M., 8 days after birth.

DISCUSSION

Maynard Cohen, M.D.: After reading the summary of this interesting case, my first impression was that the tentative diagnosis of intracranial hemorrhage was correct. However, a number of other diagnostic possibilities need to be considered, and certain questions must be raised.

The striking findings—irritability, vomiting, which became projectile, fever, weight loss, convulsions, twitching, head rolling, nystagmus—are indeed consistent with a central nervous system involvement, either of a primary or secondary nature, notwithstanding the fact that they are not diagnostic.

Two metabolic disorders come to mind, tetany of the newborn and hypoglycemia. There is no mention of calcium determination or positive Chvostek and Trousseau signs. To be sure, an apparently positive Chvostek is frequently found in newborns and the clinical value of the sign may be questioned. The clinical course of newborn tetany is rarely as severe as the case under discussion and a very ready response to the administration of calcium and milk ordinarily occurs. The convulsive symptoms on a hypoglycemic basis interests me particularly because of the selection of a case dating back to 1927, which may be due to chance or to the fact that subsequent information of interest regarding the mother has come to light. The baby at 4155 grams was of above average weight. It has recently become known that babies of diabetic or pre-diabetic mothers are large, have an abnormal blood picture often resembling erythroblastosis foetalis, and may have low blood sugars at birth, with convulsions that respond to glucose by mouth or intravenously. There is, however, no indication of nucleated red blood cells found on smear, which would eliminate this possibility along with the incompatibilities of the patient's and mother's blood.

Any basic anomaly of the cerebrum, heart, kidneys or gastro-intestinal tract could account for the findings. However, the baby was apparently normal at birth; there is no indication that there was interference with voiding or bowel movements, or that abnormal masses or cardiac murmurs were noted.

It is certainly disturbing that a patient whose illness is as serious as this one and whose outcome was fatal should be described as "entirely normal on physical examination."

We know that a newborn with a blood stream infection may have an overwhelming illness without fever, evident portal of entry of infection, or specific findings other than appearing ill. The white blood cell count of 20,000 is above the upper limits for the newborn period, and this is a point in favor of infection. The common sources of infection, of course, may be respiratory, from some one in attendance to the patient, enteral, umbilical

or following a circumcision. It is remarkable to me that sepsis is so rare in the newborn period considering the potentialities of infection. In this instance a blood culture and stool culture would have been helpful to us. I do not understand why the two lumbar punctures and one cisternal puncture were unsuccessful and can only assume, perhaps in error, that the difficulty was technical. Examination of the spinal fluid would have been invaluable to eliminate spinal fluid infection, the presence of red blood cells or xanthochromia.

In summary, I feel that the underlying disorder is intracranial probably intracranial hemorrhage, which may have been subdural, subarachnoid or into the brain substance itself.

Dr. Judge: Two recent cases of sepsis from one newborn nursery make the house staff very much aware of this type of illness in a newborn. Infection is a not uncommon happenstance, particularly meningitis, which probably should be considered more often.

Question from the floor: What are the possibilities of a brain tumor or congenital hydrocephalus?

Dr. Cohen: All of the above diagnostic possibilities are likely. The absence of blood and spinal fluid cultures or any positive findings relative to the size of the head or the status of the fontanelle make it difficult to be certain about any of them. I do not know about the incidence of brain tumor in the newborn except that I feel it is very rare.

PATHOLOGIC DISCUSSION

E. Clarence Rice, M.D.: At autopsy, which was limited to the head, the anterior and inferior surfaces of the brain were covered by a thick greenish purulent exudate from which the pneumococcus was cultured. Sufficient exudate was found about the brain stem to probably account for the inability to obtain cerebrospinal fluid. The blood vessels of the meninges and brain were engorged. The cerebrum was softer than normal. Microscopically the inflammatory reaction involved not only the meninges but the superficial portion of the brain. The ventricular system appeared normal.

Meningitis in the newborn, while not common, has been seen frequently enough to warrant its consideration as a course of the neonatal irritative phenomena of the central nervous system. One should always consider the possibility of meningitis in the newborn when spinal bifida and a meningomyocele is present. In such cases the portal of entry is obvious and the infecting organism is usually a member of the intestinal group of bacteria or possibly a staphylococcus. In other cases the cause of the meningitis and the portal of entry of the infecting organism is not always so evident. We recently autopsied two babies who died of Alkaligenes

fecalis meningitis during the first two weeks of life. Both of these children, one white and one colored, were delivered in the same institution within a few days of each other. It would seem that an attendant, either doctor or nurse, was responsible for these patients becoming infected. They were delivered in different delivery rooms and were kept in separate nurseries. Some time ago newborn twins were admitted to this hospital with streptococcus meningitis. A similar organism was cultured from the mother's spinal fluid but she at no time appeared to be ill. The infection in these two patients apparently came from the mother. One of our patients with meningitis acquired a meningococcus infection within the first two weeks of life, the infection apparently being brought to the patient by a relative who was found to be carrier.

In the case under discussion the diagnosis of meningitis was not seriously considered and it was thought that a meningeal or intracranial hemorrhage was responsible for the patient's condition. We have no knowledge of the other pathological conditions which were present due to the limited necropsy.

The mother at no time showed any evidence of a respiratory infection or had any disturbance of her puerperium. One has some reason to assume that the patient acquired the infection from either a nurse or physician. The inability to obtain cerebrospinal fluid made it impossible to arrive at a definite diagnosis.